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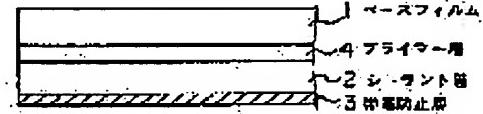
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(54) COVER TAPE FOR PACKAGING ELECTRONIC PART, AND MANUFACTURE THEREOF

(57)Abstract:

PURPOSE: To make a cover tape highly antistatic while keeping excellent transparency, and to easily provide constant adhesive strength for the cover tape in sticking to a carrier tape.

CONSTITUTION: A cover tape that can be heat-sealed to a carrier tape having continuous pockets for housing small electronic parts therein is formed at least of three layers including an antistatic layer 3, a sealant layer 2 and a thermoplastic resin film layer 1. The antistatic layer 3 is made of a tin in average particle size of $0.1\mu\text{m}$ or below, an antimony and/or indium oxide corpuscles in 20–85wt.% and a water-soluble transparent resin in 80–15wt.%. An antimony-tin compound oxide made by doping 1–10% of antimony calculated in terms of oxide, or a tin-indium compound oxide made by doping 1–10% of tin calculated in terms of oxide is used as the oxide having surface resistivity of 10^4 – $10^7\Omega$, and the compound oxide is desirable to be such that has oxygen lattice defect and is of corpuscles in average particle size of 0.1 – $0.5\mu\text{m}$.



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CLAIMS**[Claim(s)]**

[Claim 1] It is the covering tape which can carry out the heat seal of the receipt pocket which contains small electronic parts to the carrier tape made from plastics formed continuously. At least A transparence thermoplastics film layer, a sealant layer, an antistatic layer, The covering tape characterized by being what has a surface-electrical-resistance value (104-107ohm) by consisting of three layer of ** and this antistatic layer consisting of tin of 0.1 micrometers or less of mean diameters, antimony, and/or 20 - 85 % of the weight of oxide particles and 80 - 15 % of the weight of transparence resin of in JUUMU.

[Claim 2] The covering tape of claim 1 which is the oxide of the antimony tin with which oxide converted antimony into oxide and doped it 1 to 10%, and is the particle whose mean diameter is 0.1 micrometers - 0.05 micrometers.

[Claim 3] The covering tape of claim 1 which is the oxide of tin-in JUUMU with which oxide converted tin into oxide and doped it 1 to 10%, and is the particle whose mean diameter is 0.1 micrometers - 0.05 micrometers.

[Claim 4] The covering tape of claim 1 characterized by an oxide particle being a thing with an oxygen lattice defect.

[Claim 5] The covering tape of claim 1 whose thickness of an antistatic layer is 3 micrometers or less.

[Claim 6] The covering tape of claim 1 characterized for the polyester film whose transparence thermoplastics film layer is 6-30 micrometers by two sheets or sticking three sheets.

[Claim 7] It is the covering tape which can carry out the heat seal of the receipt pocket which contains small electronic parts to the carrier tape made from plastics formed continuously. At least An antistatic layer, a transparence thermoplastics film layer, a sealant layer, The antistatic layer which consists of four layers of antistatic layer **, and touches a sealant layer The covering tape characterized by being what consists of tin of 0.1 micrometers or less of mean diameters, antimony, and/or 20 - 85 % of the weight of oxide particles and 80 - 15 % of the weight of transparence resin of in JUUMU, and has a surface-electrical-resistance value (104-107ohm).

[Claim 8] The covering tape [claim 9] of claim 7 characterized by two antistatic layers being the same presentations ** Form in the bottom of heating pressurization the sealant layer which has adhesion ability at one side of a thermoplastic bright film. ** The antimony oxide with which mean particle diameter has the particle configuration of 0.1 micrometers or less in this sealant stratification plane side, The dispersion liquid which distributed the constituent which consists of 20 - 85 % of the weight of conductive particles which consist of tin oxide, oxidization in JUUMU, or these multiple oxides, and 80 - 15 % of the weight of transparence resin one to 40% of the weight in the aquosity medium are applied. ** The manufacturing method of the covering tape which can carry out the heat seal of the receipt pocket which is characterized by subsequently drying, and which contains small electronic parts to the carrier tape made from plastics which it has continuously [claim 10] The covering tape manufacturing method of claim 9 characterized by carrying out corona discharge treatment of this sealant layer after [which forms a sealant layer in one side of a bright film] forming in the case

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention protects these electronic parts from an electrostatic discharge, on the occasion of storage of chip mold electronic parts, transportation, and wearing, since it mounts in an electronic-circuitry substrate, it is aligned, and it relates to the covering tape by which a heat seal may be carried out to the carrier tape made from plastics which has the function which can be taken out.

[0002]

[Description of the Prior Art] Small electronic parts, such as transistors including IC, diode, a capacitor, and a piezoelectric-device register, are packed and supplied in recent years at the package object which consists of a carrier tape made from plastics which formed continuously the pocket of the configuration which can contain electronic parts, and a covering tape in which a heat seal is possible to this. After exfoliating a covering tape, electronic parts are taken out automatically and mounted in the circuit board.

[0003] Although the high-performance electronic parts miniaturized more have come to be supplied with improvement in a surface mount technology in recent years at high speed, the semiconductor device generally called active parts has the problem will destroy and deteriorate with static electricity weakly generated in friction by the vibration at the time of package object migration etc. in static electricity, and static electricity at the time of the covering tape exfoliation performed at the time of mounting, and this electrostatic cure has become with the important problem.

[0004] The method of making an antistatic agent and an electrical conducting material mix in an adhesives layer as an electrostatic cure of a covering tape is learned (JP,63-149868,U, JP,5-8339,A). Moreover, the thing in which the layer which consists of impalpable powder and binder resin, such as a tin oxide compound, was formed to the opposite side of a field with the hot-melt-adhesive layer of a covering tape is known (JP,4-367457,A). Furthermore, only applying an antistatic agent to an electronic-parts receipt tray outside surface is performed for many years (publication number No. 217377 [Showa 61 to] etc.).

[0005]

[Problem(s) to be Solved by the Invention] The approach of introducing an electrical conducting material into adhesives is difficult to spoil transparency with the ingredient to mix or to control the bond strength of adhesives, and its effectiveness of a thing is not enough, either. The approach of forming the layer of a metallic oxide in the opposite side of an adhesives layer still needs to improve for removal of static electricity which transparency will be spoiled by extent with sufficient antistatic nature if conductivity is made high, and is generated at the time of the exfoliation from a carrier tape. Moreover, the approach of applying the antistatic agent of a surface-active-agent system is not eternal, and since bleeding arises, seal nature becomes unstable, and the approach of mixing has the fault which the effectiveness itself does not have. This invention aims at offer of the covering tape in which sufficient antistatic nature is that it is also semipermanent, with sufficient transparency maintained.

[0006]

[Means for Solving the Problem] This invention is the covering tape which can carry out the heat seal of the receipt pocket which contains small electronic parts to the carrier tape made from plastics formed continuously. It consists of three layers, a transparency thermoplastics film layer, a sealant layer, and an antistatic layer, at least. This antistatic layer consists of tin of 0.1 micrometers or less of mean diameters, antimony, and/or 20 - 85 % of the weight of oxide particles and 80 - 15 % of the weight of transparency resin of in JUJUMU. It is the covering tape characterized by being what has a surface-electrical-resistance value (104-107ohm). Moreover, are the process and the sealant layer which has adhesion ability under heating pressurization is formed in one side of the bright film of ** thermoplasticity. ** The antimony oxide

which has the particle configuration whose mean particle diameter is 0.1-0.05 micrometers in the obtained sealant stratification plane, ** Apply the dispersion liquid which distributed the constituent which consists of 20 - 85 % of the weight of conductive particles which consist of tin oxide, oxidization in JUUMU, or these multiple oxides, and 80 - 15 % of the weight of transparency resin in the aquosity medium, and it is the manufacturing method of the covering tape characterized by ranking second and drying.

[0007] The technical contents of this invention are explained in detail below. If drawing 1 explains the component of the covering tape of this invention, it is one side of a base film 1 from the primer layer 4, the sealant layer 2, and the antistatic layer 3 if needed. The transparent biaxially oriented film of a base film 1 is desirable, and polyester, polypropylene, its nylon, etc. are desirable as a material. Especially biaxial extension polyester film is desirable, and corona discharge treatment or the thing by which plasma treatment is carried out is still more desirable. 10-60 micrometers is suitable for the thickness of this film layer.

Although this film layer may consist of one sheet, it is desirable two sheets or to stick three sheets and to use the identitas which is 6-30 micrometers, or a different film. Thus, if a lamination film is used, tensile strength improves and it is effective also in curl prevention.

[0008] Although the function of an anchor effect is achieved, since it is not necessarily required if the bond strength of a base film and a sealant layer is enough, the primer layer 4 prepared between a base film and a sealant layer is also ommissible. The thing of polyurethane and a polyester system can be used as these primers layer. A film is more enough as the thickness of a primer layer than about 5 micrometers or this.

[0009] A sealant layer is prepared the inside of a base film, or inside a primer layer. It compares with a base film as a sealant layer, and what has the low melting point is used. For example, low-melt point point polyester, low-melt point point polyethylene, polypropylene, etc. are desirable. In addition, various kinds of hot melt type resin, such as a polyvinyl butyral, ethylene / vinyl acetate system polymer, styrene / butadiene system, ethylene / acrylic ester system, and styrene / ethylene system, is used. 5-50 micrometers is suitable for the thickness of a sealant layer. It is desirable to perform corona discharge or plasma treatment after formation at the same time it forms a sealant layer.

[0010] As for the antistatic layer formed in a sealant stratification plane, a mean diameter becomes desirable 0.1 micrometers or less from 0.1-0.05-micrometer tin, antimony, and/or 20 - 85 % of the weight of oxide particles and 80 - 15 % of the weight of transparency resin of in JUUMU, and the surface-electrical-resistance values of this layer are 104-107ohm. An oxide particle has the oxide of the antimony tin which converted antimony into oxide and doped it 1 to 10%, or especially the desirable oxide of tin-in JUUMU which converted tin into oxide and doped it 1 to 10%. Since a certain thing of the lattice defect of oxygen excels the perfect oxide system in conductivity a little, these oxides are desirable. The oxide particle with such an oxygen lattice defect heats an oxide particle under existence of alcohol or a hydrazine hydrate, and is obtained. Or when calcinating settling, such as a hydroxide obtained from each metallic compounds by hydrolysis, under an oxygen ambient atmosphere, an oxygen content is adjusted, and the particle of blue gray is obtained, and can make and manufacture.

[0011] Generally, the wavelength of a visible ray is 0.4-0.8 micrometers, and only by making particle size small, since light scattering becomes small, it is known that transparency will be maintained, but secondary condensation cannot take place, or the particle of the 1/2 or less magnitude cannot perform homogeneity distribution, and cannot demonstrate an antistatic function. Although, as for the antimony used for this invention, tin, and/or the oxide particle of in JUUMU, a thing 0.1 micrometers or less is used for mean particle diameter, 0.1-0.05 micrometers of desirable spherical and needlelike particles of the range of 0.08-0.06 micrometers are used especially preferably. If it is made to distribute using the transparency resin which is carrying out homogeneity distribution in water-soluble resin which is used by the invention in this application, or an aquosity medium even if it is such a particle, homogeneity distribution is possible, without secondary condensation taking place. At the time of 0.1 micrometers or more, if it is difficult to make a surface-electrical-resistance value into 104-107-ohm level if thickness of a coat is not thickened fairly and it thickens, predetermined transparency cannot be maintained. If set to 0.05 micrometers or less, in case water soluble resin will be distributed, it becomes difficult to make it not produce secondary condensation.

[0012] The distribution to the transparency resin of this particle adds the oxide particle distributed in water to what dissolved for example, transparency resin in the water containing a small amount of alcohol, and is performed to it by stirring. Various kinds of mixers, such as a spiral and a planetary ** hybrid, perform stirring. It is also possible to add the various surfactants of an anion, Nonion, and a cation system, the coupling agent of a silane system, etc. for the improvement in dispersibility. If many [the rate of the oxide particle in transparency resin is 20 - 85 % of the weight, if fewer than this, an antistatic function is not enough, and], the stability of a layer will worsen. Although transparency resin acts as a binder of an oxide

particle, for example, a polyvinyl alcohol system, a polyethylene-glycol system, a polyester polyol system, a polyethylene vinyl acetate system, a polyether polyol system, a polyolefine system, etc. are used, especially the thing of a polyester system is desirable and can use BAIRONARU TM which dissolved commercial Byron (Toyobo Co., Ltd. make) or this in water. Moreover, it can be used by choosing suitably the surfactant with which the thing of a polyurethane system or an epoxy system also makes distribution to an aquosity medium homogeneity. The aquosity medium used here can also be used by mixed stock with a methanol with water or the water of the amount of dominance, this, and compatibility, ethanol, t-butanol, dioxane, etc.

[0013] Although what is necessary is just to make into the concentration suitable for the coating method to a base film top concentration of the sum total of the oxide particle distributed in the aquosity medium, and transparence resin, generally about 5 - 30% of the weight of its concentration is preferably desirable one to 40% of the weight. . As for the method of application, various approaches, such as spray coating, a bar coat, a roll coater, air knife coater, and a dip method, are used. As for the thickness of an antistatic layer, it is desirable after desiccation to consider as the thickness of 0.5-2.5 micrometers preferably 3 micrometers or less.

[0014] Although the antistatic layer of this invention needs to form in a sealant stratification plane, it does not interfere, even if it forms in an opposite side, i.e., the lateral surface of a base film, if . Although the antistatic layer 5 in this case may differ from the antistatic layer 3 by the side of a sealant stratification plane, its same thing is desirable. everything but the reason for forming the antistatic layer 3 inside a sealant layer in this invention preventing static electricity generating at the time of friction or covering tape exfoliation -- the degree of adhesion strength of a carrier tape and a covering tape -- getting it blocked -- it is for making peel strength easy to control.

[0015] Although it is used for it, carrying out a seal to the carrier tape which contained electronic parts, the covering tape of this invention needs to exfoliate a covering tape, when electronic parts are mounted in the circuit board. The peel strength at this time may be too weak, or it must not be too strong, and although it is necessary to make it the fixed reinforcement of 20-70gf within the limits, control of sealing conditions is [that it is easy to change by the time amount, the temperature, and the pressure when carrying out welding of the covering tape to a carrier tape] difficult. Moreover, since the adhesion side of a carrier tape is not necessarily smooth, it is easy to produce variation in bond strength. Since there is no big effect in bond strength by the buffer effectiveness of this layer, therefore peel strength becomes fixed even if it carries out the pressurization seal of the covering tape strongly, since an antistatic layer exists between a sealant layer and the adhesion side of a carrier tape side in the case of this invention, the working range which can be put on an adhesion process can be taken widely. Thus, visible-ray permeability is 80% or more, and the electronic parts of the interior enclosed with the carrier tape can check the constituted covering tape certainly by viewing or the photosensor.

[0016]

[Example] What stuck two 12-micrometer biaxial-stretching polyester film (Toyobo Co., Ltd. make E5100) using polyethylene system adhesives was used as a base film. The sealant layer of a polyethylene system was laminated in thickness of 35 micrometers at this one side. After carrying out corona discharge treatment of this sealant layer, the thickness after desiccation formed in both sides of a film respectively the antistatic layer which is 1.9 micrometers by the bar coat method. The antistatic layer used here was formed using the liquid distributed in the aquosity medium so that particle size might become 25% at water-soluble polyester resin (Byron by Toyobo Co., Ltd.) by making into solid content what carried out homogeneity distribution of the tin-antimony multiple oxide which is 0.1-0.07 micrometers 40% of the weight.

[0017] The surface-electrical-resistance value of the obtained covering tape is 1.1×10^6 ohms, and showed the extremely excellent antistatic ability. The Hayes value is 3.2% and showed the outstanding transparency. In order to see the effect of aging and humidity, the surface-electrical-resistance value after neglect was measured for two days by RH15% of dryness. It is 1.1×10^6 ohms, and change was not seen, but the result was understood that there is little aging also under desiccation.

[0018] This covering tape was performed on the carrier tape made from vinyl chloride by the seal head temperature of 140 degrees C, and pressure 3 kg/cm², and 2 times of welding was performed in sticking-by-pressure time amount 0.3 seconds. And although it was not necessarily smooth, peel strength was in the range of 40 to 60 gf/mm, and was very fixed. [irregularity minute to a part for the flange equivalent to the adhesion side of a carrier tape]

[0019]

[Effect of the Invention] By this invention, it can have an advanced antistatic function, with advanced

transparency maintained, and the covering tape which can set the bond strength to a carrier tape constant easily can be supplied.

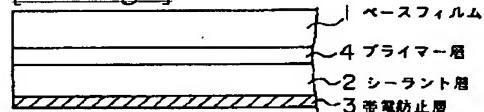
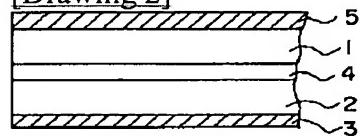
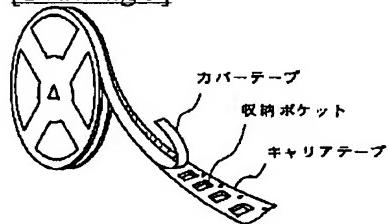
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DRAWINGS

[Drawing 1]**[Drawing 2]****[Drawing 3]**

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